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JANUARY 30, 1984

CHEMICAL & ENGINEERING

NEWS

PRELIMINARY PROGRAM
ACS spring meeting, St. Louis
Page 37

Farm markets spark big ammonia turnaround

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CHEMICAL & ENGINEERING NEWS

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JANUARY 30, 1984

News of the Week

■ **Chemical industry earnings more than doubled in fourth-quarter 1983.** **Page 6**

■ **President's state-of-the-union address emphasized plans for a space station, preservation of the environment.** **Page 7**

■ **Justice Department files lawsuit on behalf of EPA to recover cleanup costs of dioxin-contaminated sites in Missouri.** **Page 7**

■ **Researchers succeed in growing whole plants that retain functioning foreign DNA segments from their host cell.** **Page 8**

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Science

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Preliminary Program

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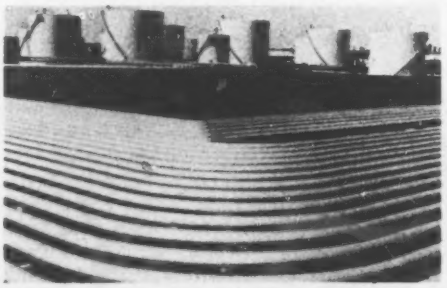


Cover Story

Petrochemicals are being helped by reviving farm markets, but imports may dampen prospects. Page 10

U.S. Farming Pickup Helps Natural Gas-Based Petrochemicals

Ammonia and urea will profit handsomely from turnaround in U.S. fertilizer markets, but imports loom as threat and already are hurting methanol

Bruce F. Greek, C&EN Houston

A much brighter year is shaping up in 1984 for some of the leading small-molecule commercial chemicals made from natural gas—after severe problems a year or two ago. But in the long run, U.S. producers of these chemicals could still lose, and are beginning to in some major cases, because of tough, fast-growing competition from natural gas-producing regions abroad.

That is the somewhat bittersweet outlook for ammonia, urea, methanol, and formaldehyde, whose immediate market prospects appear on the following pages. Three of the four chemicals will do well in revived farm markets and a continued strong construction market. Unfortunately, the fourth—methanol—is caught in foreign trade problems that could foretell problems for ammonia and urea as well.

The big fact of commercial chemical life in the 1980s for products such as these is the dramatic rise in non-U.S. production using ultracheap natural gas, especially in Canada, Mexico, and the Middle East. For methanol, a significant and possibly ever-growing share of the U.S. market will be supplied by imports from these countries. The exact size of import growth is difficult to pin down because of potential alternative markets in other countries for methanol that might come into the U.S., other possible uses of the raw material gas in the producing countries, and future production costs of methanol in the U.S. But so far, U.S. methanol imports are zooming, and U.S. producers are hurting.

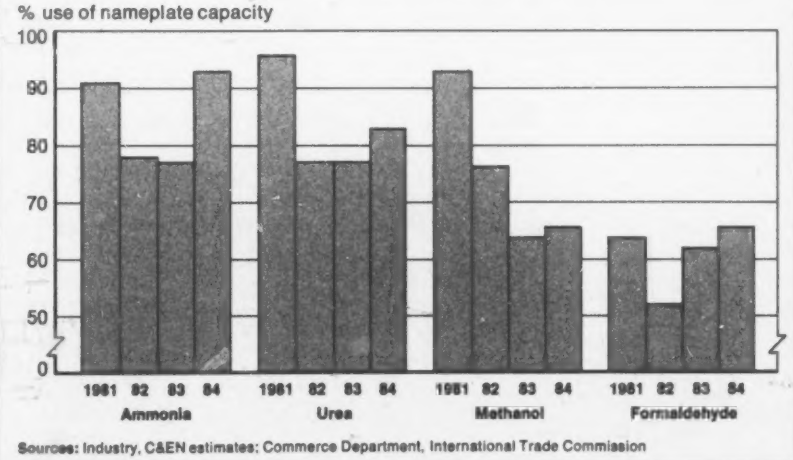
Key Chemicals

Formaldehyde to date is the great exception to such trade woes and has shown a fairly normal recovery since early 1983. Large-scale formaldehyde imports are considered very unlikely because technology to convert methanol to formaldehyde is simple and shipping costs high. In other words, formaldehyde will tend to be made close to where it is used.

Ammonia has no such long-run trade barrier but is free of trouble for the moment. In a stunning reversal from a year ago, the pungent chemical is headed for a near bonanza, in part because a capacity squeeze is due after widespread plant closings. Everything is going right on the farm in 1984, where most ammonia winds up. The end of the government's acreage-crimping payment-in-kind program promises a catch-up year in fertilizing that will greatly boost ammonia and, to a lesser extent, urea.

However, urea too underscores the threat of imports, which are holding down its production gains even now and could top urea exports this year. Foreign production of nitrogen fertilizers from low-cost gas could keep these imports of ammonia and derivatives such as urea on a sustained rise. Beyond 1984, the U.S. could become a net importer of nitrogen fertilizers after being a vigorous net exporter in the past. One result could be another round of ammonia plant closings. Roughly a third of the U.S. ammonia capacity has been shut down already over the past five years. Should the present surplus of U.S. natural gas be worked off in a few years and prices rise, much additional ammonia capacity, and along with it urea capacity, also could be scrapped.

Ammonia leads capacity use increase in 1984



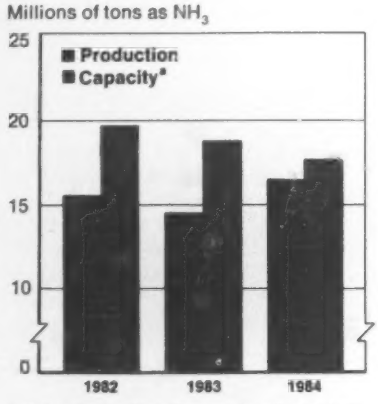
Sources: Industry, C&EN estimates; Commerce Department, International Trade Commission

Ammonia

NH_3

- ***Demand jumping***
- ***Capacity falling***
- ***Prices rising fast***

PRODUCTION/CAPACITY



a First quarter; substantial capacity still shut down with scrappage expected to continue.

HOW MADE

Catalytic reaction of nitrogen from air and hydrogen from natural gas

MAJOR DERIVATIVES (U.S.)

Nitric acid 20%, urea 20%, ammonium phosphates 15%

MAJOR END USES (U.S.)

Fertilizer 80%, fibers and plastics 10%, explosives 5%

FOREIGN TRADE

Exports—down sharply to less than 0.5 million tons, imports—steady between 2 million and 2.5 million tons

PRICES

List prices rising from $150 per ton on Gulf Coast

COMMERCIAL VALUE

$3 billion for production, 1984

A banner year sums up the 1984 outlook for ammonia. Subject to the vagaries of world markets, production of feed grains in the U.S. will run all-out this year. To achieve this output, farmers will have to add heavy amounts of nitrogen fertilizer to the soil this spring. And nitrogen fertilizer means almost exclusively ammonia and its derivatives.

For ammonia producers, the current outlook is an almost unbelievable turnaround from the product's wretched performance a year or two ago, when prices collapsed and plants came down by the dozen. Companies' capacity trimming at the time has a lot to do with tight market conditions expected in 1984. Actual ammonia output will remain at least 15% below the record 19.7 million tons in 1980.

At the moment, practically all operable ammonia capacity is either running or in startup. Some additional capacity that is not now operable also may be undergoing modification and repair and will run as soon as possible. How much ammonia will be produced during calendar 1984 is difficult to forecast because of these capacity unknowns.

As much as 1 million tons per year of capacity carried in C&EN's total of 17.8 million tons possibly will not operate again, but until 1984 is over, it will be hard to tell. If none of this capacity comes on and the average operating rate is a very high 95% of nameplate capacity, then about 16 million tons of ammonia could be produced. One industry expert predicts this level of operation is about all the industry could do.

More likely, some of the very marginal capacity actually will run because of the probability of much higher prices and because of continuing lower prices for surplus natural gas. Pressure from these high selling prices and very strong demand this spring also will cause some existing capacity to be debottlenecked, letting it run above rated capacity. As a result, ammonia production could reach 16.5 million tons.

This production level will be 2 million tons, or 14%, more than badly depressed 1983 production and 1 million tons over 1982 output, when inventories ballooned. But the new boom still will not meet expected demand for ammonia and its derivatives. Helping to close the gap will be net imports of anhydrous ammonia of at least 1.5 million tons. Imports of other nitrogen-containing fertilizer materials also will be up, but exports of nitrogen fertilizers are expected down again except possibly for ammonium phosphates. So analysts forecast small net imports of nitrogen fertilizer materials in 1984—a sharp contrast to bulging net exports in recent years.

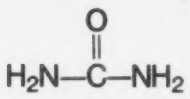
Needless to say, inventories of ammonia and derivatives are expected to be down substantially this spring. As much as 1 million tons of fertilizer materials (in terms of nitrogen) will come from this source. By the end of the fertilizer year (June 30), analysts predict nitrogen inventories of about 1 million tons in all forms—very snug compared to past levels.

This inventory drawdown, the push on production, and net imports provide obvious clues to pricing. Prices moved up to about $150 per ton of ammonia in January from $115 a year ago, and everyone in the industry expects further increases. Actual prices will depend heavily on the weather this spring. If the planting season starts early, pressure on ammonia and derivative fertilizer supplies could be heavy, pushing prices temporarily quite high, followed by a slump in the summer. If the planting season is normal or a bit late, distribution problems and price pressure for ammonia and derivatives will be less but still substantial, analysts say.

Nonfertilizer uses of ammonia and derivatives account for about 20% of total U.S. demand. Feed additives, known generally as nonprotein nitrogen products, take less than 5% of ammonia demand and are quite mature (slow growing) products. Explosives, mostly used in mining, take another 5%. Polymers for fibers and fabricated plastics take most of the rest. None of these uses, although expanding in the economic recovery, will grow enough to pull ammonia away from agriculture.

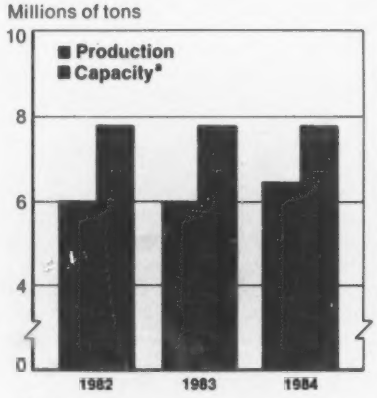
Overall, for ammonia producers, 1984 will be a boom year after several tough ones. Even so, ammonia output will be far below previous records because of the severe cuts in capacity.

Urea



- ***Demand improving***
- ***Capacity flat***
- ***Prices rising***

PRODUCTION/CAPACITY



a First quarter.

HOW MADE

Reaction of ammonia and carbon dioxide under pressure

MAJOR DERIVATIVES (U.S.)

Urea-formaldehyde resins 5%

MAJOR END USES (U.S.)

Fertilizers 80%, animal feed 10%, adhesives and plastics 5%

FOREIGN TRADE

Exports—flat, about 1.25 million tons in 1984; imports—rising to more than 1 million tons

PRICES

$130 to $150 per ton on Gulf Coast

COMMERCIAL VALUE

$1 billion for production, 1984

Urea will participate in the expected fertilizer boom of 1984 but not to the extent of ammonia. The main reason is that urea, a relatively simple derivative of ammonia, has become more of a world commodity than has its parent chemical. Such large quantities of urea are made outside the U.S., that international trade, including major imports into the U.S., influences U.S. urea production as much as does demand in the U.S.

U.S. urea production is expected to increase less than 10% in 1984, by about 500,000 tons to a total of 6.5 million tons. This gain follows two years in a no-growth trough.

But production could go higher, some analysts point out. Urea could act as a major swing product in meeting U.S. demand for nitrogen fertilizers this year. A larger than expected jump in demand could result from higher farm commodity prices, the end of the government's payment-in-kind program, and an effort to reverse reduced yields in 1983 due to the drought.

Traditionally, U.S. urea enjoyed large net exports. Farmers in many other countries favored urea over other nitrogen fertilizers for ease of handling. Until urea production began in areas such as Trinidad, Mexico, Canada, the Middle East, and Eastern Europe in the past five years, the U.S. dominated urea trade. However, urea production has jumped in many of these regions, which have low-cost natural gas. Imports now are rushing into the U.S., partly to fill expected demand for nitrogen fertilizers but also to take advantage of the strong dollar. In 1984, analysts say U.S. urea trade could balance or possibly go slightly into net imports.

What a contrast to urea's export strength of just a few years ago, which was a major influence in the product's all-out operation from 1979 through mid-1981. In 1980, exports jumped nearly a third to close to 2 million tons. But the boom broke late the next year, and for 1984 analysts expect exports down almost 40% from the peak to about 1.25 million tons.

This radical change in trade means that U.S. producers must sell more of their output in the U.S. market and face greater competition. This accounts for the relatively lower operating rate for urea plants compared to ammonia. If 1984 urea production reaches 6.5 million tons, nameplate capacity will run at about an 84% rate, probably 10 percentage points below the rate for ammonia.

As with ammonia, a lot of urea capacity has been shut down. Of this, more than 1 million tons has been scrapped in recent years. Some of the listed 7.8 million tons of capacity also could be headed for scrap and will not run at all during 1984, even with strong demand for nitrogen fertilizers. Again as with ammonia, it will take much of 1984 to tell what actual operable capacity for urea really is.

Ironically, despite these capacity questions, the longer-term demand curve for urea shows faster growth than for many other forms of nitrogen fertilizer. Both solid urea and urea in solutions, usually with ammonium nitrate, continue to find strong acceptance by farmers because of easy handling and good agronomic results. This growth is expected to hold up, probably because of farmers' preference for urea over direct application of anhydrous ammonia.

Nonfertilizer uses of urea are about a fifth of total use. Feed additives are the largest, but are not growing much, cycling up and down with changes in cattle numbers in feedlots.

Urea also goes into important commercial polymers. The urea-formaldehyde polymers' volume runs five to six times that of urea-based melamine. All these polymers go largely into construction uses, so the outlook here will follow the plateauing housing market. Simplicity of the polymerization process allows producers to run plants lightly or heavily as demand requires.

Since housing markets may be leveling off, nonfertilizer uses of urea will not have much impact on total demand in 1984. Analysts don't foresee major long-term influence on total demand either, because of these uses' relatively small size and cyclical nature.

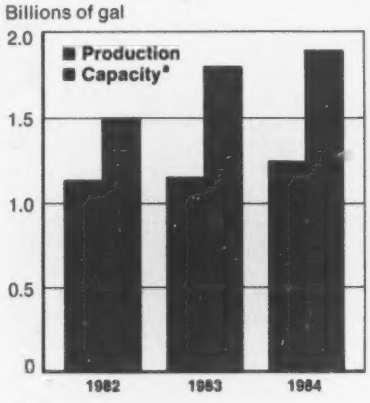
On balance, then, urea faces a better year mainly because of strong U.S. fertilizer demand. But the big news of 1984 could be that producers find net imports in their foreign trade.

Methanol

CH_3OH

- ***Demand weak***
- ***Capacity leveling off***
- ***Prices way down***

PRODUCTION/CAPACITY



a First quarter.

HOW MADE

Reaction of carbon monoxide with hydrogen made by reforming natural gas or heavier hydrocarbon fractions; or by coal gasification

MAJOR DERIVATIVES (U.S.)

Formaldehyde 30%, acetic acid 10%, methyl tert-butyl ether 10%

MAJOR END USES (U.S.)

Polymers used as adhesives, fibers, and plastics 50%

FOREIGN TRADE

Exports—declining to about 50 million gal in 1984, imports—rising to about 150 million gal

PRICES

List prices slashed to 45 cents a gal

COMMERCIAL VALUE

$550 million for production, 1984

Methanol's main note in 1983 was a sad one—lack of participation in the general recovery in U.S. chemicals production. The reason is the same as for urea's problems, only more so: a major shift in foreign trade, perhaps a harbinger of things to come for other leading organic chemicals.

Production of methanol in 1983 probably just about matched that in 1982, about 1.14 billion gal. The government's official 1982 production figure is some 7.56 billion lb, according to the International Trade Commission. Industry analysts expect the difference for 1983 to be no more than about 2% when final ITC figures are in.

In 1984, some further increase in methanol production is expected because of the continuing economic recovery and increasing newer fuel uses. The gain, however, won't be much even though this commodity is starting a year behind most other chemicals. Current consensus puts 1984 methanol production 5 to 10% higher, to bring the total to about 1.25 billion gal. Some pessimists believe growth will be less than 5% in 1984 because big methanol uses might not perform so well as expected in a slowing economic expansion.

At such a pace, methanol will certainly not lack capacity. At present, counting some units shut down for more than a year, swollen U.S. capacity is above 1.9 billion gal a year. If 1984 production reaches 1.25 billion gal, the industrywide average operating rate will be just 66%, barely up from 64% last year.

In 1983, probably 500 million gal of methanol capacity didn't operate. Some of this was shut down all year, and the remainder operated intermittently. Hence, the actual average operating rate at plants still running was much higher, probably about 88% of nameplate capacity. The same plant split will prevail in 1984.

The availability of additional capacity keeps severe downward pressure on methanol prices. List prices in many cases were slashed in 1983 to reflect actual selling prices more closely. The new low prices hardly increased sales of methanol at all. They did, however, underscore why some units were down for the whole year or significant parts of it. Prices in the 40 to 45 cent-per-gal range for large volumes at the producing plant site are about the cash cost of production, according to one industry analyst. No return on investment results from such prices for merchant sales. Hence, only if a company can convert methanol to derivatives can it justify having a methanol plant, unless the plant has been fully depreciated or the company can find natural gas at distress prices in the current surplus.

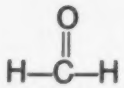
During 1983 a big shift in methanol foreign trade forced an extra 100 million gal or so of U.S. production into the U.S. market. Production as a result stood still even though U.S. consumption went up. A similar impact on production could occur in 1984, holding down production gains.

Changes in the end-use pattern of methanol are expected to be small during 1984. In general, all uses will grow in line with the economy. The largest uses, formaldehyde and acetic acid, are heavily dependent on home building. Forecasts for home building and commercial construction are for a static 1.7 million housing starts and about the same square footage in commercial building as in 1983.

Fuel uses, including fuel components such as methyl *tert*-butyl ether (MTBE) used as antiknock additives in unleaded gasoline, could have the highest growth rates among methanol uses in 1984. (Many people concerned with methanol consider MTBE a chemical use even though its only significant outlet is in gasoline.) One drawback, though, is that some gasoline blenders have found a way to lower their costs by adding methanol as pure fuel costing half that of other gasoline components. The problems motorists encounter with these gasolines tend to give all uses of methanol in gasoline, for example as a cosolvent with *tert*-butyl alcohol, a bad name. Such an image problem could put a damper on the overall growth of methanol use in fuel.

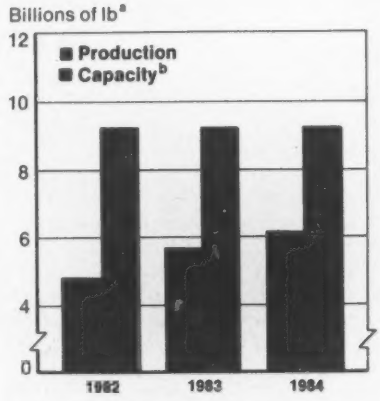
So for 1984, methanol won't make much headway in getting plant use back up, and imports will eat up a bigger share of U.S. demand. Prices barely covering operating costs will cancel financial returns.

Formaldehyde



- ***Demand surge slowing***
- ***Capacity flat***
- ***Prices steady***

PRODUCTION/CAPACITY



a As a 37% solution. b First quarter.

HOW MADE

Catalytic oxidation of methanol

MAJOR DERIVATIVES (U.S.)

Urea-formaldehyde resins 25%, phenol-formaldehyde resins 20%, polyacetal 5%, butanediol 5%

MAJOR END USES (U.S.)

Adhesives 60%, plastics 15%

FOREIGN TRADE

Negligible

PRICES

List prices about 9 cents per lb; merchant volume small

COMMERCIAL VALUE

$500 million for production, 1984

A cursory look at 1983 production data for formaldehyde and methanol suggests that something is amiss. Formaldehyde production increased 19%, whereas methanol production just about stood still. Yet, commercial U.S. formaldehyde is made only by oxidizing methanol, so additional methanol must have come from somewhere. The answer is methanol's nemesis of the 1980s—a big net increase in imports, which analysts estimate at about 100 million gal.

As a result, formaldehyde production recovered well in 1983, rising to about 5.7 billion lb (as a 37% solution). This production increase wiped out the recessionary decline of 1982, when production dropped to 4.8 billion lb from 5.7 billion lb in 1981.

In fact, production did better in 1983 than most industry analysts expected. They had forecast gains as 1983 opened ranging from 0.6 billion to 1.0 billion lb, with most opinion around 0.7 billion lb. The optimists may have an even better case. Although final production numbers still are months off, a strong October suggests that the full-year increase could hit 1 billion lb, possibly more, after an especially high fourth quarter.

For 1984, analysts' growth expectations for formaldehyde have cooled. Growth still is expected, but not nearly so much as in 1983. A consensus holds that another 400 million lb of production, or 7%, will appear in the total in 1984, bringing it to 6.1 billion lb. Possibly 10% growth is possible if the housing industry continues strong.

Average plant operating rates for formaldehyde are still low. In 1983, the rate was about 62% of estimated nameplate capacity. This is an inexact number because of the large number of small plants, which make capacity estimates difficult. For 1984, the operating rate likely will rise to just under 70%.

Some formaldehyde capacity may be shut down permanently, but not announced as such. Current capacity estimates probably are 5 to 10% overstated. New formaldehyde plants are unlikely to be built soon unless a special situation develops for a use in a location beyond economical shipping distance from an existing plant.

Obviously, with these low operating rates, many plants were run just part time. There are many variations in operating methods and in meeting captive needs for formaldehyde. Most formaldehyde is used at the production site but under some circumstances a producer of a derivative might find it less expensive to buy from a nearby formaldehyde plant and pay shipping charges even though the solution-type product is largely water.

The upswing in production in 1983 and 1984 continues despite lack of a final government decision on regulating formaldehyde because of possible irritation to tissues or carcinogenic effects. At this time, analysts won't guess the impact of any such regulation on production and use of formaldehyde.

Whatever, formaldehyde volume in 1983 roared back with the recovery in housing, which requires formaldehyde in several major resins used in adhesives and plastics. Resins made with either phenol or urea account for almost half of total formaldehyde use in the U.S. Most of these resins go into particle board, plywood, insulation, and other materials for housing. New housing starts in 1983 about doubled from 1982, pulling down bloated inventories of plywood and the like and restarting producers' inventory building. Currently, some industry analysts believe inventories of these building materials are too high, although others think that inventories are normal for the beginning of the building season.

Other uses of formaldehyde such as engineering polymers—the polyacetal resins—also are recovering pretty well as their markets in housing, appliances, and automobiles pick up. Many of these uses are relatively small, and some are developing much more rapidly than others. All are cyclical and depend on the health of the economy for strength in demand. None will cause unusual jumps in overall formaldehyde demand in 1984.

For 1984 then, formaldehyde will ride with its established uses, a majority of which go to housing. Since housing is expected to continue strong for most of the year, use of formaldehyde likely will increase further after a surprisingly strong 1983.

Chemicals' lead in stock market narrows

Early last fall, chemical issues were outpacing the stock market like Ferraris racing Fords. A few other major stock indexes were moving fast then, true, but around August the chemical group discovered a high gear that the overall market lacked. Thanks to that burst of power, C&EN's chemical stock index stood almost 55% higher by Oct. 8 than it had a year earlier. The Dow Jones Industrial Average, by comparison, had risen a comparatively puny 29% during the preceding 12 months of stock market rally.

Those high-performance days seem over now. During November and December, the Dow Jones average more or less maintained speed. Chemical stocks, on the other hand, slowed markedly. Between Jan. 21, 1983, and Jan. 20, 1984, the Dow Jones average rose from 1052.98 to 1259.11, an increase of about 20%. During the same period, C&EN's chemical stock index climbed about 22% from 218 to 265 (1954 = 100). Chemical stocks as a group still are outperforming the top stock market indicators, but not by nearly the same margin as before.

In fact, that margin is likely to narrow. Jack Henry, chemical industry analyst for E. F. Hutton, predicts that chemical stocks will perform at about the level of the market for the bulk of 1984. Other securities analysts are taking a similar stance. Oppenheimer & Co., for instance, is carrying no major chemical companies on its recommended list.

It's not that analysts are worrying whether chemical earnings will continue to be vigorous. Hutton's Henry, for one, still forecasts an average earnings gain of 30% in the chemical industry in 1984. Oppenheimer chemical analysts Richard A. Derbes and Charles J. Rose predict that in 1984 earnings will be up 20% at Rohm & Haas, 21% at Witco Chemical, 22% at Nalco Chemical, 32% at American Cyanamid, 34% at Reichhold Chemicals, 34% at PPG Industries, and 36% at Allied.

The problem is that stock prices are very likely already high enough to accommodate the probable scale of chemical earnings increases in 1984. Henry notes that during the third-quarter 1983 stock price surge, analysts probably overestimated 1984 chemical earnings. The result: "Stock prices have already fully discounted those expectations," he remarks.

Other stock analysts substantially agree. For example, Oppenheimer's Derbes recently increased his forecast of Rohm & Haas 1984 earnings in anticipation of continued benefits from reduced costs and a recovery in the agricultural sector. "The stock is not on our recommended list," he points out, however, "because we believe its current value fairly reflects its future prospects."

Nor is there much expectation among industry watchers that earnings will surprise them by growing more than is now forecast, a development that might lead to another stock price surge. There are two major reasons for this. For one, producers will continue to have trouble raising chemical product prices aggressively this year because of weak feedstock costs, a generally disinflationary attitude downstream, and tougher competition from imports. The import problem ties into the second reason, the strong dollar, which will reduce exports and undercut the kind of volume growth that normally would be expected in a year in which gross national product is forecast to rise 4 to 4.5%.

Still, performing at the level of the market may not necessarily be bad. There are a good number of stock analysts who believe that the current bull market, which began in August 1982 and seems to have been running out of steam lately, will surge again through at least the first three quarters of this year. They base their optimism on factors like rising productivity, lower inflation, and the somewhat mystic relationship between Presidential election years and stock market performance—usually a positive one.

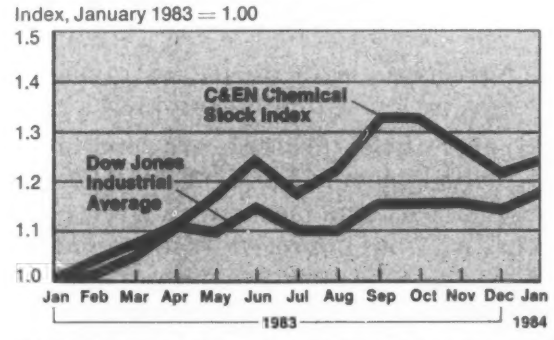
But all these calculations lie in the long shadow of the federal deficit. For all the optimism of the Administration, many analysts are deeply worried about the deficit, and figure that 1985 could very well put an end to the current recovery. For market-level performers, as chemical stocks are likely to be, such general expectations in the investment community could bode ill. □

Chemical stocks have performed better than most indexes in the past year. . .

	Jan. 20, 1984	Jan. 21, 1983	% change
C&EN Chemical Stock Index[a]	265	218	21.6%
Dow Jones Industrial Average	1259.11	1052.98	19.6
New York Stock Exchange Composite	96.13	83.18	15.6
New York Stock Exchange Industrials	112.22	95.23	17.8
American Stock Exchange Index	226.71	182.78	24.0
Over-the-Counter Composite	284.41	243.97	16.6
Over-the-Counter Industrials	329.44	292.50	12.6
Standard & Poor's 500	166.21	143.85	15.5
Standard & Poor's 400 Industrials	187.43	161.71	15.9

a C&EN index based on stock prices for Allied, American Cyanamid, Celanese, Dow Chemical, W. R. Grace, Monsanto, and Union Carbide.

. . . but last fall's glory days seem unlikely to be repeated soon



Note: Both indexes reindexed to January 1983 = 1.00 to make comparable. Based on mid-month stock data.

Soviet Gas Pipeline to Europe Starts Up

Siberian natural gas now is being piped to France, according to Gaz de France, the country's national utility. Deliveries likely will amount to 35 billion cu ft this year.

There is no way of verifying whether the gas indeed has its origin in the Yamal peninsula area, site of a massive natural gas deposit being developed by the Soviet Union. The Soviets claim it does, honoring a 1982 contract signed with the French which calls for their purchase of up to 282 billion cu ft annually over a 25-year period beginning Jan. 1.

The pipeline itself has been the focus of world attention since it first was proposed some years ago. If, as is being said, the line is in operation, it represents a significant technical achievement. Portions of its 3600-mile length traverse difficult terrain. Through it will flow gas destined also for Austria, West Germany, Italy, and Switzerland.

West Europeans view the Siberian deposit as another source of gas to supplement supplies from the Middle East, North Africa, the Netherlands, and the North Sea. The U.S., on the other hand, has voiced concern that the gas could become a pawn in the chess game of international politics. West European dependency on the Soviets for significant quantities of gas, the U.S. argues, provides the Soviets, if they so wished, with some considerable leverage over Europe's economies.

Considering the charges and countercharges that have crisscrossed the Atlantic on the issue, it may be understandable to overlook the fact that Soviet natural gas has been piped to Western Europe for a number of years. According to figures compiled by the Paris-based International Energy Agency, Soviet gas already accounted for 70% of Austria's overall gas consumption in 1982. West Germany, Italy, and Switzerland, too, are dependent on gas from the U.S.S.R. to varying degrees. IEA doesn't have a breakdown for France, which isn't a member of the agency.

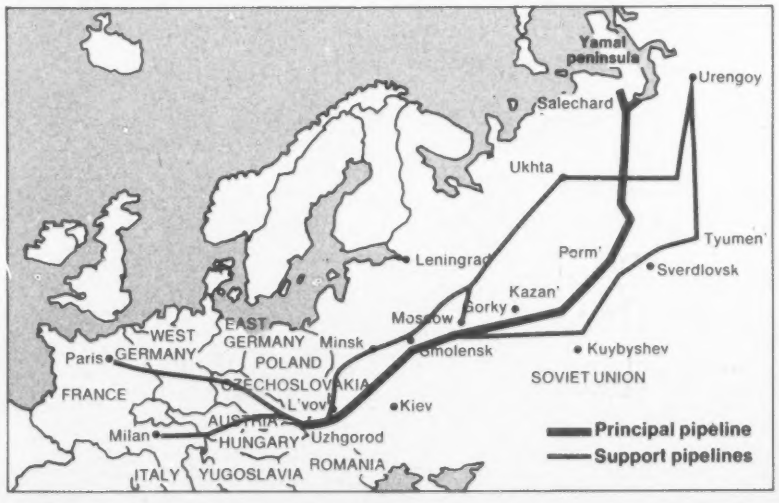
There is no doubt that use is set to increase. IEA projects that Austria's reliance on Soviet gas, for instance, could rise to 80% of its 1990 gas requirements.

Projections of gas use point to increased dependency on U.S.S.R.

Millions of metric tons of oil equivalent	Total gas consumption	Gas imported from U.S.S.R.	% of total
Austria			
1982	3.7	2.6	70%
1990	4.5	3.6	80
West Germany			
1982	38.0	6.5	17
1990	51.0	14.0	27
Italy			
1982	22.1	6.0	27
1990	32.0	12.0[a]	37
Switzerland			
1982	1.1	0.2	18
1990	1.4	0.4	29

a Contract for additional Soviet gas imports has been signed, but awaits Italian government approval.

Soviet pipeline to bring natural gas from Siberia to Europe



It is reasonable to assume that some of the gas will be used as feedstock by the chemical industry. According to estimates drawn up a few years ago by the European Council of Chemical Manufacturers' Federations (CEFIC), Austria this year was expected to use 465,500 metric tons of oil equivalent of gas for making chemicals, 67% of the 1984 expected total hydrocarbon feedstock requirement. Next in terms of gas needs by the chemical industry are Switzerland with 59,500 metric tons of oil equivalent, 47% of its total feedstock requirement; Italy with 3 million, nearly 31% of its total; and West Germany with 3.6 million, 15% of its total. CEFIC estimates gas feedstock use by the French chemical industry this year at 3.5 million metric tons of oil equivalent, 24% of its total need.

It's possible, of course, that these projections won't prove accurate in absolute terms. But the figures might be taken to provide an order of magnitude of the role of gas, and possibly of Soviet gas, as a chemical feedstock in these countries relative to alternate liquid and solid hydrocarbons.

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EPA Probes Groundwater Pollution Threat

Groundwater contamination is a growing problem in the U.S. It has led to the closing of public and private wells in at least 25 states. One of the possible major sources of groundwater contamination is surface impoundments used for the storage, treatment, and disposal of liquid wastes. Congress is showing a growing interest in regulating these facilities, and the Environmental Protection Agency has just published the National Surface Impoundment Assessment Report.

The survey, mandated by the Safe Drinking Water Act, was prompted by the knowledge that increased emphasis on air and water pollution controls resulted in an increase in sludge and waste water generation and disposal. But little information was available on the numbers, location, and construction of surface impoundments or their potential for groundwater contamination.

Although the data are old—they were collected between 1979 and 1980—the report does provide the broadest look yet at the use of impoundments and how that use may affect groundwater quality. The EPA survey done in conjunction with the states identified a total of 80,263 sites containing 180,973 impoundments; 31,286 of the sites were subjected to a desk-top analysis to determine their potential to contaminate groundwater.

Of the sites, 31% were associated with oil and gas extraction, commonly known as brine pits; 25% with municipal water and waste treatment facilities; 18% with farming, crop production, and animal husbandry; 15% with processing, storage, or disposal of industrial waste; 9% with ore extraction and washing, crushing, and sorting; and 2% could not be categorized.

Among findings of the survey:

- Nearly 50% of the sites are located over thin or permeable unsaturated zones that are vulnerable to contamination.
- 70% of the industrial impoundments, 78% of the municipal sites, and 84% of the agricultural sites are unlined.
- 35% of the industrial sites contain wastes that may be hazardous, based on their standard industrial classification code.
- Nearly 30% of the sites in the industrial category are unlined and located in areas of thin or very permeable soils with good usable aquifers, with one third of the sites located within 1 mile of a water well that could be affected by contamination.
- Monitoring data show little apparent correlation between the potential for aquifer contamination and use of monitoring wells.

Nine industries account for 80% of 25,000 located impoundments

Industry	Located sites	Located impoundments	Assessed sites
Food	2087	4960	1606
Chemicals and allied products	1414	4377	1176
Stone, clay, and glass products	698	1243	580
Petroleum and allied products	671	1884	537
Fabricated metals	661	1316	513
Primary metals	574	1380	444
Power plants	543	1671	442
Lumber and wood products	348	781	294
Oil field services	266	764	97

Results of the survey led EPA to conclude that treatment, storage, and disposal of liquids in surface impoundments is common practice and, in general, impoundments have historically been constructed without apparent regard for the protection of groundwater quality and thus have a high potential for contaminating groundwater.

Despite the potential for contamination, there is no single federal law designed to protect groundwater supplies. What protection there is comes from enforcement of a number of other laws, such as those regulating hazardous waste disposal, new chemicals and pesticides, and those providing funds for cleanup of existing contamination problems. And that might be the only way to go; decontaminating groundwater once it is contaminated, even if theoretically possible, would be horribly expensive. Prevention may be the only solution.

The House recently approved an amendment to the Resource Conservation & Recovery Act that would establish a national commission to study groundwater problems and report to Congress, within two years, on recommendations for groundwater protection legislation. In addition, the bill would ban land disposal of bulk or noncontainerized liquid hazardous wastes; prohibit land disposal of six specific liquid waste streams, primarily those containing cyanide or heavy metals; and require operators of surface impoundments to install liners and leachate collection systems. Similar amendments have been approved by the Senate Committee on Environment & Public Works and are now awaiting floor action.

The Energy & Commerce Committee is considering amendments to the Safe Drinking Water Act, H.R. 3200, that would prohibit underground injection of hazardous waste near drinking water aquifers and provide states with money to identify groundwater sources and begin planning for their protection and use.

No drinking water legislation has yet been introduced in the Senate, but the Environment & Public Works Committee will be taking a close look at the issue in a series of hearings early this year. And EPA is planning a followup study to assess the current state regulatory programs and to define the problem in greater depth.

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